EOS TPC Test Installation

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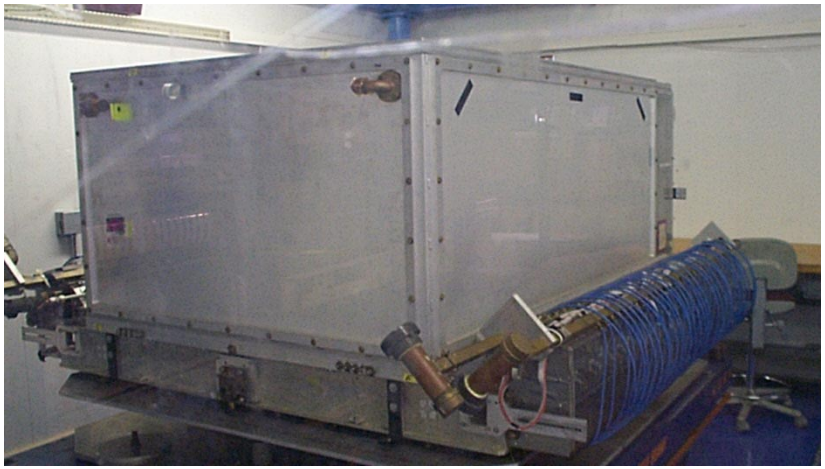
TPC Test Installation Subjects

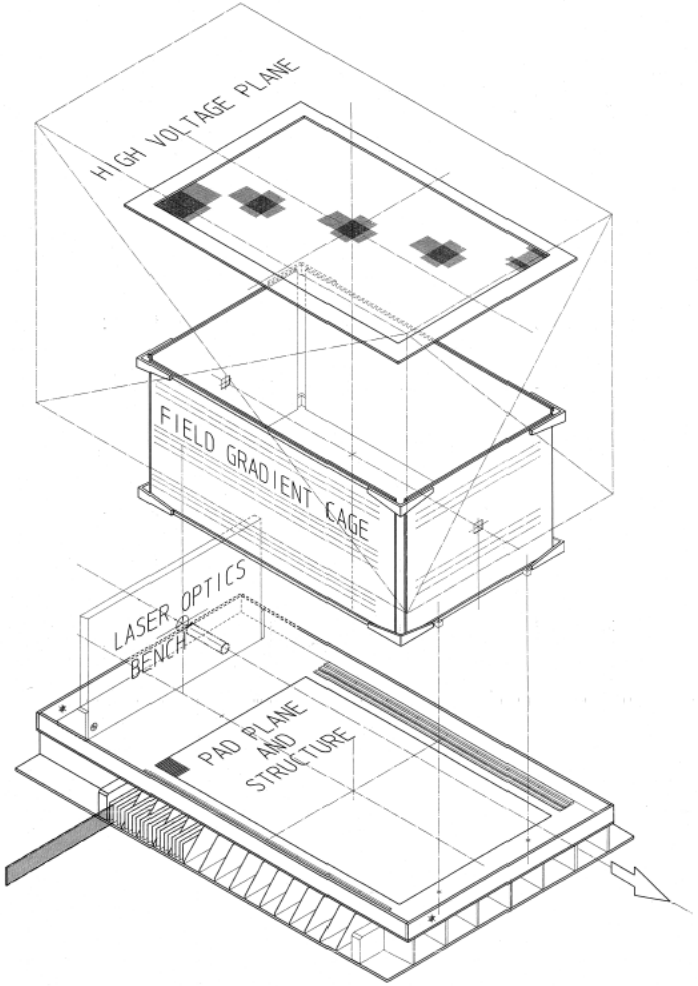
- What is it?
- Cable Plant
- Interlocks and Clock
- Gas and High Voltage
- Operation Issues
- MC7 Installation Plans
- MTest Test Plans

What is the EOS TPC?

- **LBL designed/built ~'88-90**
  - **2 m^3 P10 gas volume**
  - **150 x 96 x 75 cm^3 active**
- **1.2 x 0.8 cm^2 pads**
  - **120 x 128 = 15,360 total**
- **P10 @ atmosphere**
  - **Anode wires ~1200 V**
    - **Gas gain ~3000**
  - **Drift voltage ~9000 V**
    - **Drift velocity ~5 cm/μs**
    - **Sampled @ 20 MHz**

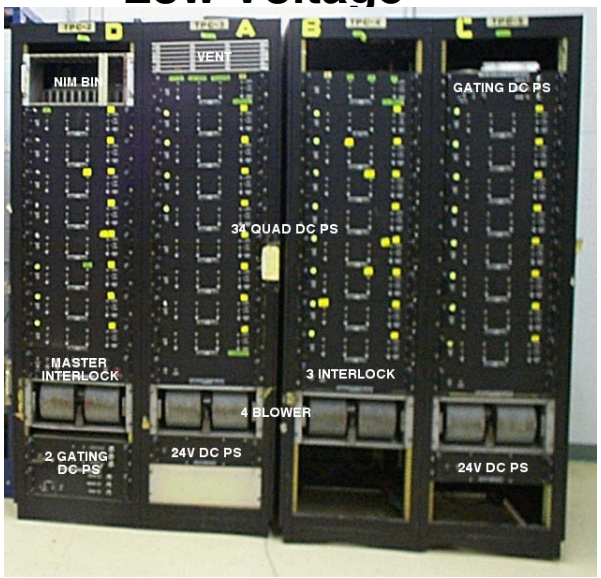


Used in LBL EOS; BNL E910, E895



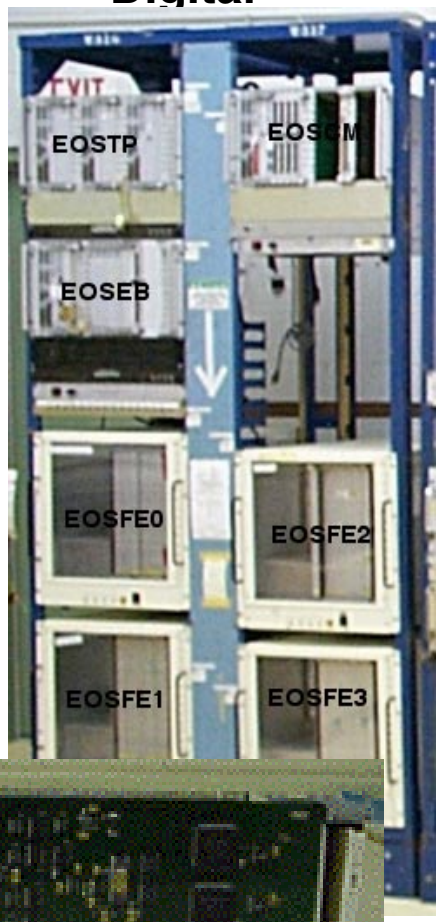
Electronics

Low Voltage

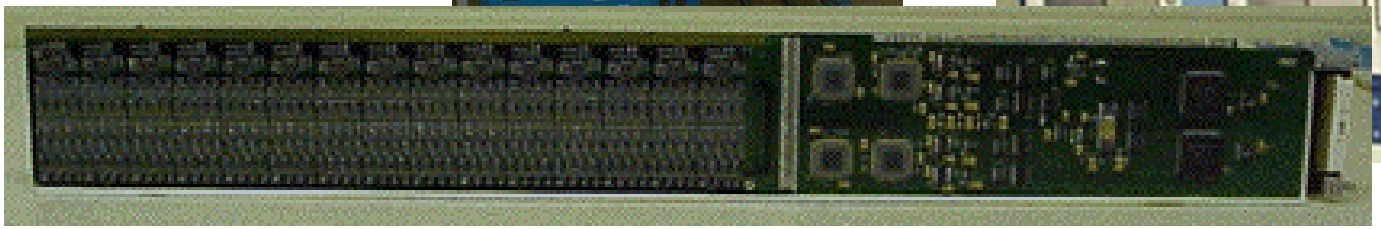


High Voltage

Digital



Stick

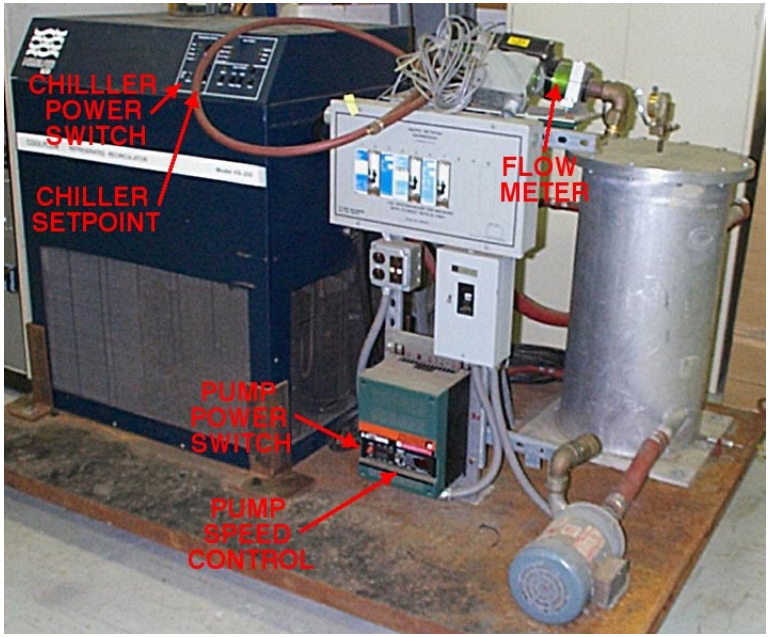


Cabling Status

- All racks in place in MTest
- All racks powered
- Cables installed:
  - Low Voltage power
  - High Voltage for anodes and cathode
  - Bitbus slow control
  - CLK/TRG master and distribution
  - Interlock and status repeater
  - Fiber optic data readout
- Still to do:
  - Gating grid drivers (2)
  - Replace fiber optics with new jacketed cable? Getting price quote.

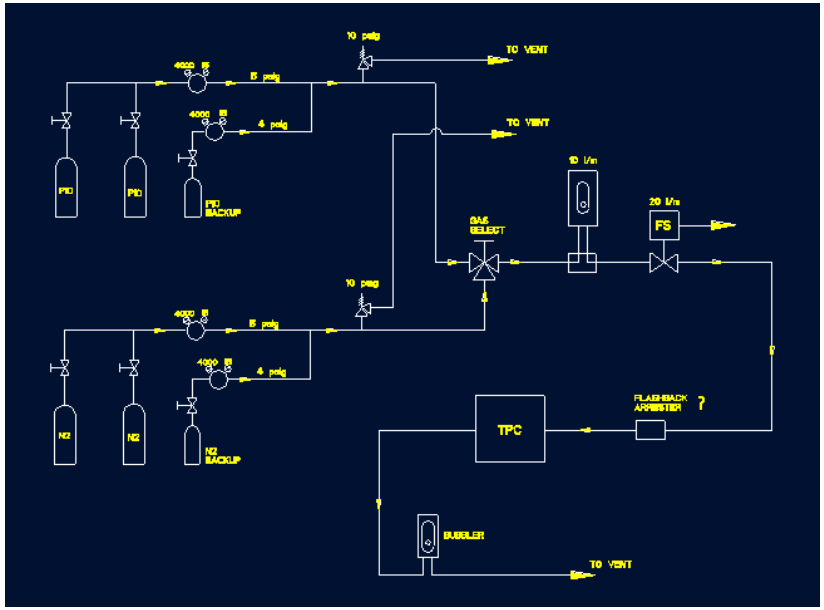
Interlocks and Clock

- **Low voltage interlocked**
  - **DC rack cooling air**
  - **TPC cooling water**
  - **CLK**
- **Rebuilt CLK/STRG module**
- **Installed water chiller and distribution**



Gas System

- Part of original system still exists.
- Preliminary Gas Safety Assessment:
  - P10 now deemed flammable.
  - MTest installation will be Class 0 (Lowest Risk)
    - Minimal hardware impact (vent line, signage, purge procedure, . . .)
- Plan to test P10 and P8 (non-flammable)
- Building temporary minimal system for Mtest



Operation Issues

- **Current operation rules:**
  - **Attended low voltage operation permitted**
    - **NO UNATTENDED OPERATION (custom cards not approved)**
  - **Flowing nitrogen (flammable gas not approved)**
- **Gas and high voltage systems:**
  - **In addition to static controls (signage, piping, vent, . . .)**
  - **Will require documented purge procedure and checklist.**
  - **Working for preliminary Operation Readiness Clearance in mid October.**
    - **Will allow P10 and high voltage.**

MC7 Installation Plans

- **Access to MC7 and Jolly Green Giant (JGG)**
  - Current downstream rollup door will be moved to upstream bump out.
    - *Provides access to upstream face of JJG magnet for TPC.*
  - Investigating use of E690 drift chamber rails for JGG as support rails for TPC in JGG
- **Gas**
  - Need to understand final (original EOS) gas system.
  - Analyze experiment gas loads as a whole.
- **Racks and electronics**
  - Need global understanding of detector front ends and rack requirements.

MTest Test Plan

- **Identify working/spare/broken sticks and receiver cards**
- **Demonstrate that TPC "works"**
  - **Show cosmic μ tracks crossing the chamber.**
  - **Show most regions sensitive (modulo bad sticks)**
- **Investigate P8 *vs.* P10**
- **Launch DAQ (re)development**